Environment Canada
Parks Service

Environnement Canada
Service des parcs

BACKGROUND INFORMATION

MANAGEMENT PLANNING PROGRAM

March 1991

PACIFIC RIM

National Park Reserve

Canada

TABLE OF CONTENTS

INTRODUCTION 1

SECTION I: THE EVOLUTION OF A NATIONAL PARK 2

AN INTRODUCTION TO PACIFIC RIM NATIONAL PARK RESERVE 3
LONG BEACH UNIT 4
BROKEN GROUP ISLANDS UNIT5 5
WEST COAST TRAIL UNIT 6

SECTION II: NATURAL AND CULTURAL HERITAGE RESOURCES 7

CLIMATE 7

GEOLOGY 8

VEGETATION 11
THE FOREST 11
THE SHORE 12

WILDLIFE 14
MAMMALS 15
BIRDS 16
REPTILES 16
AMPHIBIANS 17
FISH 17

THE MARINE ENVIRONMENT 18
LONG BEACH UNIT 19
BROKEN GROUP ISLANDS UNIT 19
WEST COAST TRAIL UNIT 20

CULTURAL HISTORY 21

91-04381/

SECTION III: PARK VISITORS, ACTIVITIES AND TRENDS 24

THE LONG BEACH UNIT 24
OUTDOOOR RECREATIONAL ACTIVITIES AND SERVICES 25
INTERPRETATION AND INFORMATION 27

THE BROKEN GROUP ISLANDS UNIT 28
EXISTING FACILITIES AND SERVICES 29
INTERPRETATION AND INFORMATION 29
PAST AND PRESENT TRENDS IN VISITOR USE 30
CAMPING 30
VESSEL TRAFFIC AND ANCHORAGES 31
DAY USE 32

THE WEST COAST TRAIL UNIT 33
WEST COAST TRAIL 33
NITINAT TRIANGLE 34
CAPE BEALE 34
INTERPRETATION AND INFORMATION 35
VISITOR USE PATTERNS 35
FUTURE TRENDS 36

SUGGESTED READING LIST 37

INTRODUCTION

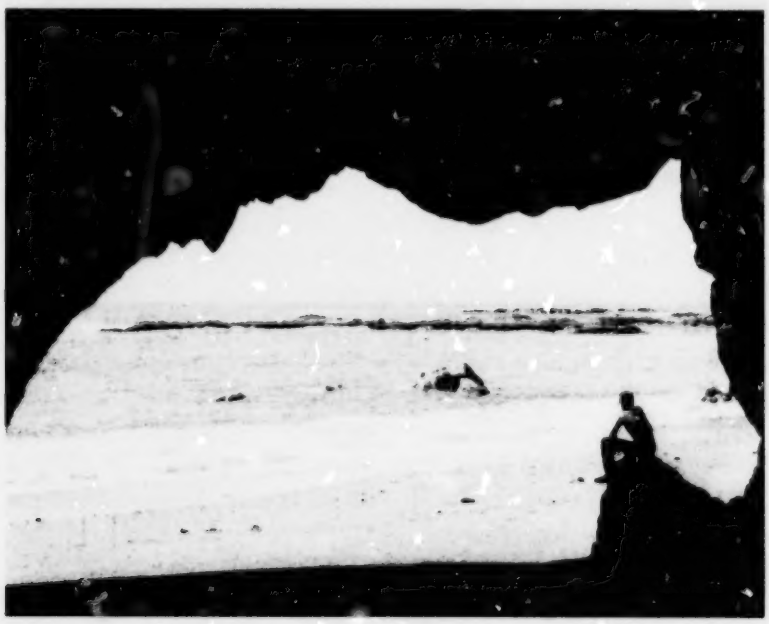
This report contains background information relating to the history of Pacific Rim National Park Reserve, its natural and cultural heritage, and the ways in which this heritage is enjoyed by park visitors. This information has been prepared for, and is to be used in conjunction with, the second newsletter distributed as part of the public consultation program for the planning of Pacific Rim. It is intended to assist the public in providing informed comment to the Canadian Parks Service on park management plan proposals for the national park reserve.

The document is divided into three main sections. Section I outlines the history of how Pacific Rim National Park Reserve came to be, and provides a basic physical description of what the park encompasses today. Since this is the first management plan to be prepared for the entire park, it is important to be aware of the historical context within which the park was established.

Section II of the report describes, in some detail, the natural and cultural heritage of the park reserve, including the history of occupation by native peoples, the contact with, and settlement by, European traders and settlers, and the richness of its natural resources, both terrestrial (land) and marine.

Section III provides a picture of how Pacific Rim is used and enjoyed by the many visitors who arrive each year. This section describes the visitor facilities and services available in the park reserve and how visitation trends and visitor use patterns have evolved over the last two decades.

The accompanying newsletter brings you up to date on the progress of the management planning program, presents the results of a comprehensive survey of park visitors in 1989, and discusses the issues and concerns that will be addressed in the plan.



SECTION I: THE EVOLUTION OF A NATIONAL PARK

Pacific Rim National Park Reserve, as we know it today, is the product of 60 years of consideration, negotiation and subsequent action by both the federal and provincial governments. The Long Beach area of Pacific Rim was first seriously examined for its national park potential in 1931, and while the beauty of this dramatic coastline was recognized, the idea did not proceed any further due to the lack of road access and the notion that the water was too cold for recreational purposes. A later proposal to convert Long Beach into a hard-sand race track also did not materialize.

Public interest in the Long Beach area was renewed in the early 1960's following the construction of a logging road linking Port Alberni to Tofino and Ucluelet, completed in 1959. This 4-hour journey over switchbacks and washouts rewarded those adventurous enough to endure it with the undisturbed majesty of the beaches and rainforest of Wickaninnish Bay. However, the roads also introduced a new cultural element to the region, and while Tofino and Ucluelet adjusted to the new connections with the outside world, Wreck Beach on Florencia Bay attracted thousands of young people wishing to pursue a lifestyle free from the pressures of modern society.

This renewed public interest also resulted in new pressures on government to protect the wealth of Pacific Rim in a national park. The National and Provincial Parks Association of Canada, (now known as the Canadian Parks and Wilderness Society), and the University of Victoria Outdoors Club, among others, were leaders in pressing for park establishment at Pacific Rim.

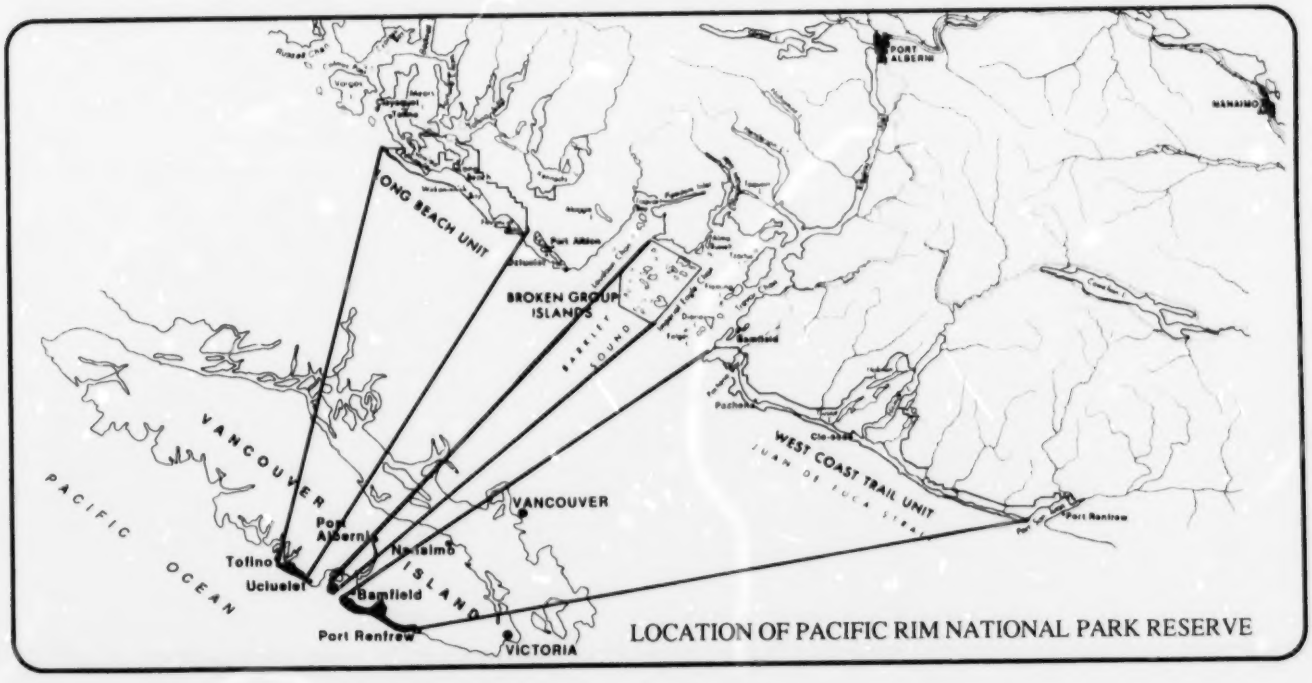
A joint federal-provincial survey of the west coast of Vancouver Island was undertaken in 1967, identifying the Long Beach - Port San Juan area as having the best national park potential in this region. A federal-provincial agreement was signed in April, 1970, to establish a national park consisting of three units: Long Beach, the Broken Group Islands and the West Coast Trail. Following a vigorous campaign from 1970 to 1972 by conservation and special interest groups, led by the Sierra Club of Western Canada, to have the corridor of the West Coast Trail widened and to include the Nitinat Triangle in the national park, an amending agreement in March, 1973, adjusted the boundaries of the Long Beach and West Coast Trail units accordingly. Subsequent negotiations between the federal and provincial governments over boundary adjustments and forestry compensation continued until 1987, culminating in the signing of a further amending agreement in September, 1988, to finalize the park reserve boundaries.

These extended negotiations have delayed the proclamation of the park reserve, and it is now anticipated that Pacific Rim will receive official national park reserve status in 1991.

Pacific Rim is referred to as a national park reserve due to the existance of an unsettled comprehensive native land claim submitted by the Nuu-chah-nulth Tribal Council based in Port Alberni. The area identified within this claim covers much of western Vancouver Island and includes all the lands and marine waters within Pacific Rim National Park Reserve. The federal government accepted this claim for negotiation in 1983, and it is not known when negotiations will commence. In the interim, and upon proclamation, the National Parks Act will apply to Pacific Rim as if it were a national park.

AN INTRODUCTION TO PACIFIC RIM NATIONAL PARK RESERVE

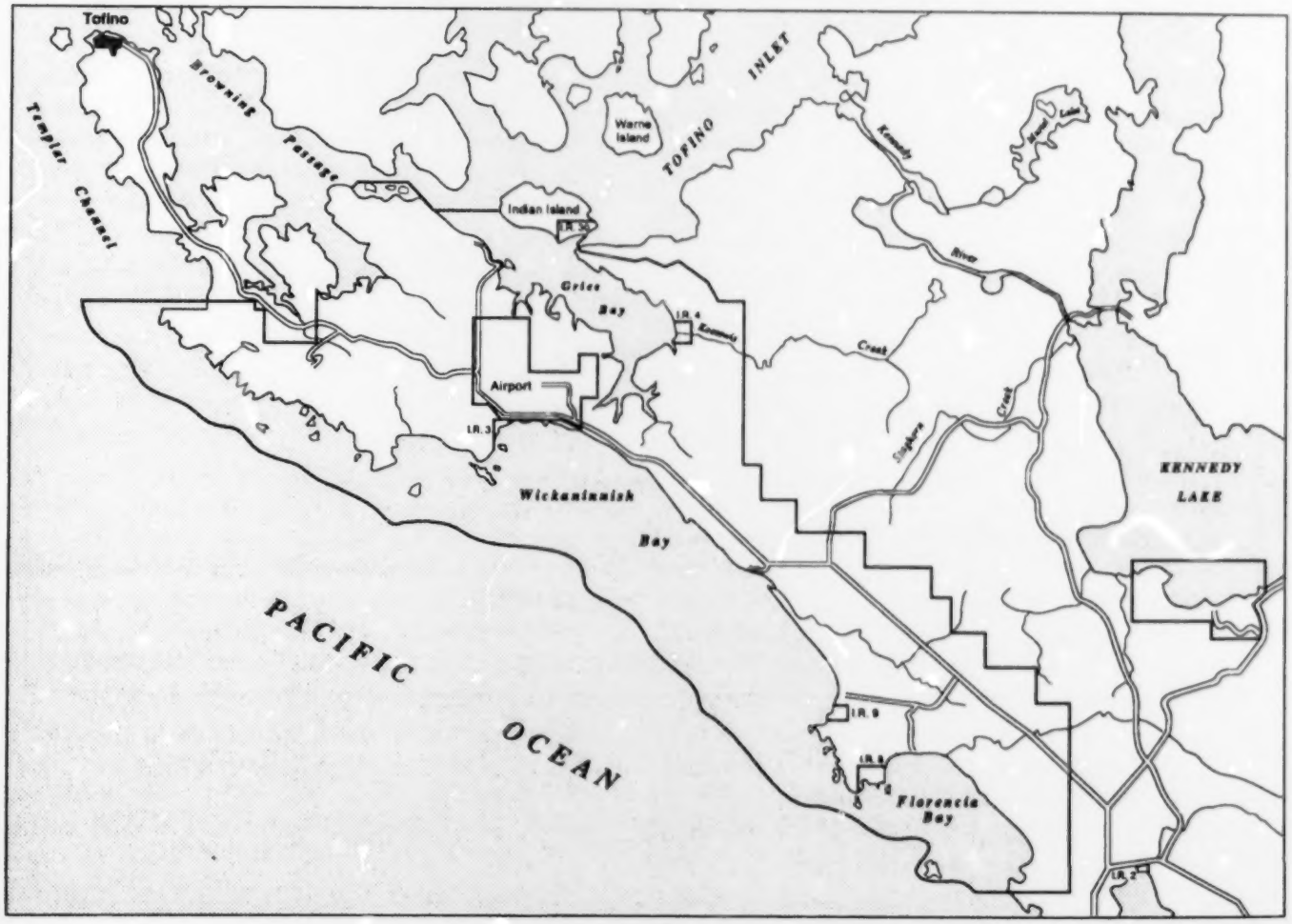
Pacific Rim National Park Reserve consists of three geographically distinct park units: the Long Beach unit, the Broken Group Islands unit and the West Coast Trail unit. In total length it stretches, although not continuously, from near Tofino in the north to Port Renfrew in the south, a linear distance of about 125 kilometres. It comprises a total area of 49,962 hectares of land and ocean, of which 28,575 hectares are land and fresh water, and 21,387 hectares are marine waters. The park is isolated from the rest of Vancouver Island by the long spine of the Vancouver Island Range. These mountains provide a visual backdrop to all sections of the park and, along with the Pacific Ocean, orchestrate the dynamic environment of the outer Pacific coastline.



LOCATION OF PACIFIC RIM NATIONAL PARK RESERVE

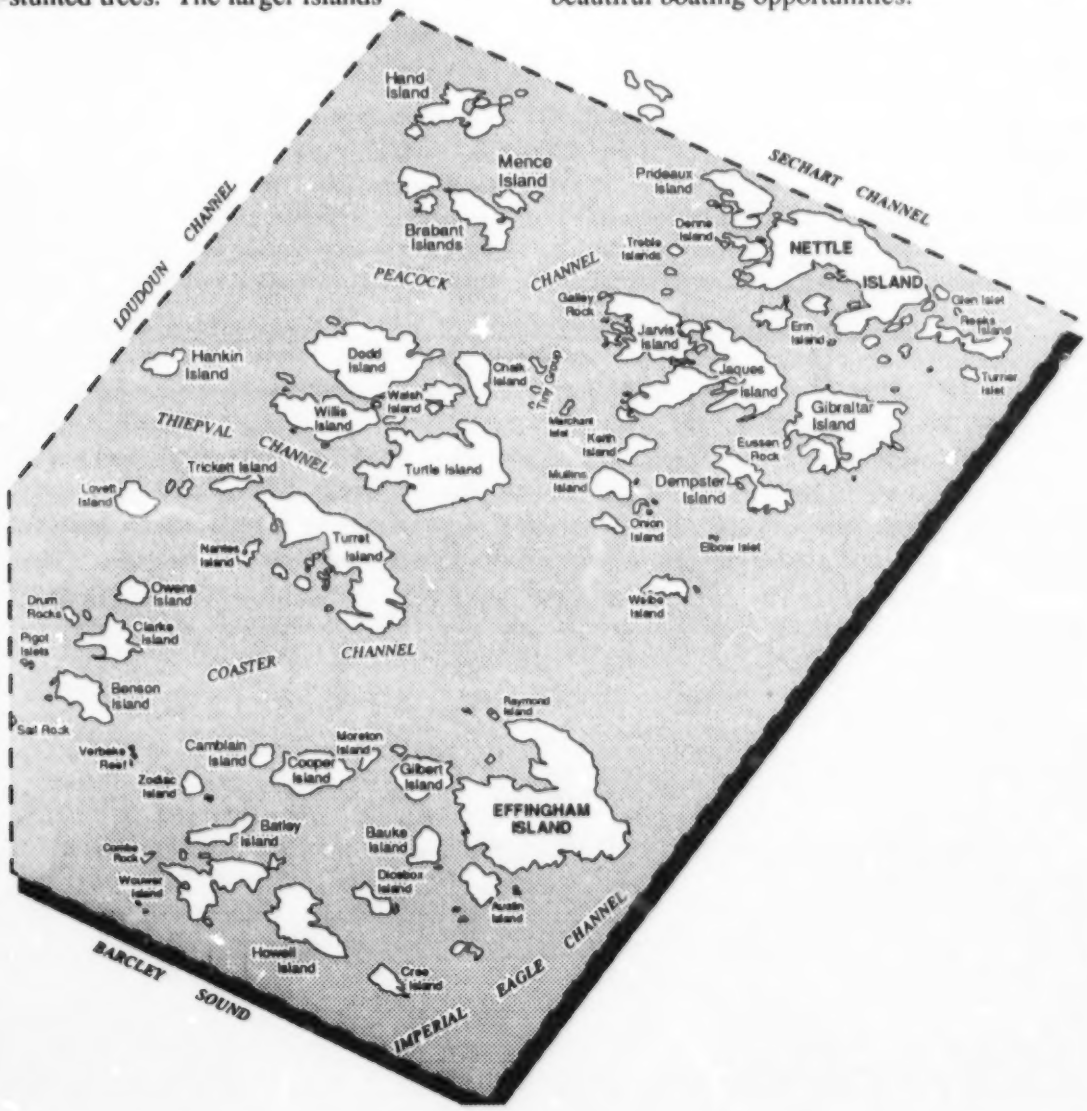
LONG BEACH UNIT

The Long Beach unit is the best known and most accessible of the three park units. It is located on a broad coastal plain northwest of Barkley Sound, a large inlet of the Pacific Ocean. The villages of Ucluelet (on Barkley Sound) and Tofino (on Clayoquot Sound) flank the boundaries of this unit. The most famous feature of the region is the long, sandy beaches. Long Beach and Schooner Cove, lying in the broad curve of Wickaninnish Bay, stretch for 16 kilometres (10 miles); and the beach at Florencia Bay, to the south, is an additional 6.4 kilometres (4 miles) long. This unit also includes a small parcel of land on the southwest shore of Kennedy Lake. The Long Beach unit comprises approximately 13,715 hectares of which 7,690 hectares are land.



BROKEN GROUP ISLANDS UNIT

The second unit of Pacific Rim, the Broken Group Islands, consists of about 100 islands and rocks located in the centre of Barkley Sound. With their adjacent waters, they encompass an area of 10,607 hectares, of which only 1,350 hectares are land. The smallest islands are no more than rocky islets bearing a few wind-stunted trees. The larger islands (Effingham, Turtle, Turret, Nettle, and Jaques) are more than a hundred hectares each and are covered by tall spruce, hemlock and cedar forests. The outermost islands are fully exposed to the force of the Pacific Ocean, but behind these islands a maze of more protected waterways provides exciting and beautiful boating opportunities.



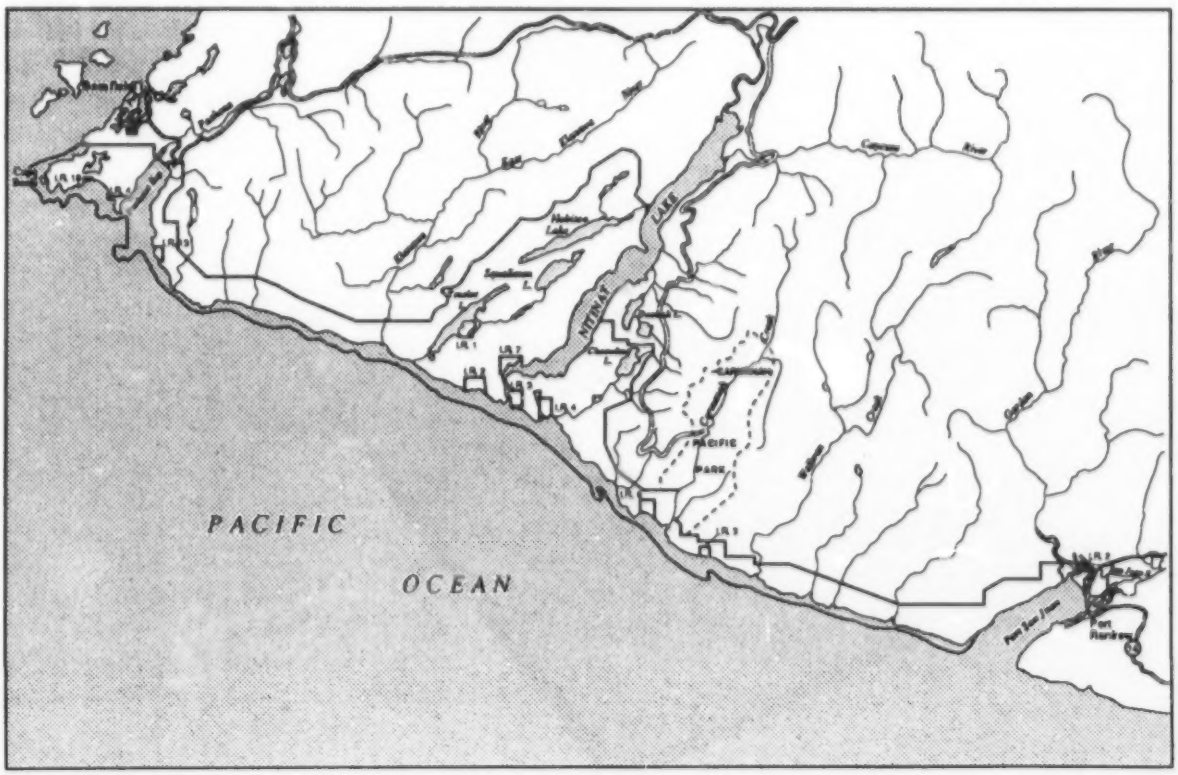
WEST COAST TRAIL UNIT

The third unit of the Park includes the section of coast southeast of Barkley Sound between the villages of Bamfield and Port Renfrew. This 25,640 hectare strip contains the 75 kilometre (46 mile) historic West Coast Trail constructed for the rescue of shipwrecked mariners. This trail largely retraces an old telegraph route first established in 1890 and follows a rugged shoreline where approximately 66 ships have met their demise along this stretch of the "Graveyard of the Pacific". The topography ranges from sandy beaches to rocky headlands and wide sandstone ledges. Caves, arches, tidal pools and waterfalls add variety to the shoreline.

The land of the West Coast Trail unit is temperate coastal rainforest dominated by old growth spruce, hemlock and cedar. Some of the tallest and largest trees in Canada are known to be on or in the vicinity of the West Coast Trail.

The West Coast Trail unit also includes the Cape Beale headland, between Barkley Sound and Pachena Bay, and the area known as the Nitinat Triangle. The Cape Beale headland has rough trail access to its outer, sandy beaches on Keeha Bay and Tapaltos Bay, and to the Cape Beale lighthouse station at the headland's extremity.

The Nitinat Triangle includes almost the entire drainage system of the Hobiton and Tsusiat Rivers and 6 freshwater lakes: Hobiton, Tsusiat, Squalicum, Little Squalicum, Hitchie, and Tsuquadra. It is an intact wilderness area having escaped any previous settlement or resource extraction.



SECTION II: NATURAL AND CULTURAL HERITAGE RESOURCES

Pacific Rim National Park Reserve is endowed with a wealth of natural and cultural heritage resources. A combination of land and sea creates its diverse range of heritage features. A unique geological story and maritime climate have orchestrated the creation of a landscape thickly overgrown with vegetation, providing refuge for a wide variety of life, both terrestrial and marine. Within its special story, a human history has also unfolded.

Every facet of Pacific Rim's heritage are interconnected. It is not just the geology that is remarkable; it is not the rainforest, the climate, nor the wildlife that stands alone to make Pacific Rim as special as it is. It is all of this park's heritage features, natural and cultural, woven together, that produce a place of national and international stature.

CLIMATE

Pacific Rim is dominated by its weather. Its location on the Estevan Coastal Plain, wedged between the sea and the mountains, creates a maritime climate unique to Canada. Other areas on the planet sharing a similar climate include coastal B.C., Washington and Oregon, the west coasts of Scotland, Chile, New Zealand's South Island and Norway.

The dominant pattern is an eastward movement of air, from the open Pacific Ocean over the coastal lowland. Moist airmasses from the Pacific are confronted by the topographic barrier of the Vancouver Island Ranges. Encountering these mountains, airflow is forced upward and cooled, forming an abundance of precipitation from a typically dense and persistent cloud cover. It is not unusual for this area to receive more than 330 cm (130 in.) of precipitation annually. The climate is characteristically mild and humid. Moderate temperatures and high precipitation combine to produce a long growing period with relatively minor variations of season. This wet, maritime climate results in a lush temperate rainforest and freedom from the extreme temperature changes so common in most parts of Canada. While the seasonal changes may be subtle by comparison, there are some recognizable patterns.

Summers on the west coast are cooler, cloudier, and wetter than adjacent regions to the south and east, such as the communities of Port Alberni, Nanaimo, Victoria or Vancouver. Winds are usually light and predominantly from the west-northwest, flowing somewhat parallel to the coast. Approximately 300 hours of sunlight can be expected for most Julys. The average mean temperature is about 17 degrees Celsius. Sea fog during July and August, and even into September, develops frequently.

Autumn marks the beginning of the wet season for the park. With increasing cloud blocking the sun, temperatures drop considerably. Strong and persistent southeasterly winds bring frequent and severe storms, typically followed by the passage of a coldfront.

Winter intensifies the wet autumn pattern. Average temperatures for the season range from a mean of 5 degrees Celsius to near freezing. Precipitation is heavy; the community of Ucluelet, during unusual typhoon-like storms, has received as much as 49 cm (19 in.) of rain in one day! Although there can be occasional wet snowfalls, snow is infrequent along this coast. Several winters may pass without receiving any snow at all. Frost is experienced each winter, but it is seldom severe. Normally, temperatures remain above freezing unless cold Arctic air moves in from the interior mountains. It is during these encroachments of cold air that frost occurs, along with clear skies and sunny conditions. Generally, periods of sunshine are reduced and highly variable during the winter months.

By March, spring is clearly evident. Sometimes the coast is released from winter as early as February. Precipitation decreases and increased solar radiation causes temperatures to rise. Clouds dissipate and bright sunshine can prevail quite frequently. The incidence and severity of storms decrease as North Pacific weather patterns stabilize with the return of spring.

The west coast of Vancouver Island has been endowed with a dynamic and exciting climate. Its volatility and its energy act as powerful attractants to the visitors of Pacific Rim. It has been humorously commented that it is one of those places which people go to because of the climate, but leave because of the weather!

GEOLOGY

The physical characteristics of a landscape are deeply rooted in it's geological history. This history, or story, can often be obscure and immensely long, and is one not easily translated into terms and timeframes readily understood by the casual visitor. An awareness of geology will give us an understanding of the land and the present patterns of life we see around us.

Three factors account for the landscapes of this park: the type of rock that forms them, the forces that created them and the erosional processes that continue to shape them.

Pacific Rim, on the western margin of the North American continent, is a geologically complex area. Its situation, near the convergence of the Pacific, the Juan de Fuca and the North American plates, places the park, quite literally, on the leading edge of plate tectonics research. The region has been the collision site for a number of ancient drifting landmasses, known as terranes, which arrived and adhered to the western edge of Vancouver Island over a long period of time between 90 and 40 million years ago. Plate tectonics, or continental drift theory, postulates that these "alien" landmasses were carried in as fault-bounded blocks on a shifting crustal plate. As a result, rock formations exposed within the park are almost exclusively different from those found anywhere else on Vancouver Island and bear witness to an exciting geological story still in progress.

The land in and adjacent to the park is divided into 2 major geologic units: the Wrangellia terrane and the Pacific Rim terrane. The Wrangellia terrane is the older and includes most of Vancouver Island east of Highway #4 in the Long Beach area, the Broken Group Islands, and most of the West Coast Trail. West of Highway #4, the younger Pacific Rim terrane is separated from the Wrangellia terrane by the Pacific Rim Fault Zone and comprises most of the Long Beach unit of the park. The Pacific Rim terrane is characterized by extensive tectonic displacements, seismic activity and subsequent faulting.

The geology of the Pacific Rim area exemplifies the complexity and volatility of the larger region of south-western British Columbia, known to be the most active earthquake region in Canada. Shaken by more than 300 tremors annually, many of which are too small to be felt, scientists believe that at least six or seven giant earthquakes have struck this region over the past 7,000 years. It is also postulated that one of the largest and potentially most destructive earthquakes in recorded history is looming in the not too distant future as stress continues to build along the area of convergence where the Juan de Fuca Plate rubs against the North American Plate off Vancouver Island.

In the Long Beach area, the bedrock consists of a complex and chaotic mixture of sedimentary, metamorphic and volcanic rock of Jurassic and Cretaceous age (65 to 185 million years old).

Further inland and east of Highway #4, igneous rocks of Early Mesozoic or Late Paleozoic age (200 to 300 million years old) are dominant. This basement complex was built upon by fringing coral reefs of ancient oceans and massive volcanic eruptions.

Greywacke conglomerate is the most widespread rock type in the Long Beach unit and is most visible at Radar Hill. A chaotic mixture of argillite (fine-grained, clay stone), volcanic tuff (consolidated volcanic ash), and chert comprises the rocks near the Wickaninnish Centre. Ribbon chert can be found at the north end of Long Beach at Box Island and adjacent islets.

Other rock types found in the Long Beach area include lenses of limestone (from coral reefs) and pillow lavas, the result of underwater volcanic vents discharging basalt. Examples of the latter are found near Wya Point.

The major rock types in the Broken Group are quartz diorite, amphibolite, agmatite and gneiss assemblages dated to the Paleozoic period (600 to 270 million years ago). The only exception to this is Triassic argillite and limestone which comprise the southern half of Howell Island and all of Cree Island.

In the West Coast Trail Unit the southeastern end is built upon Leech River Schist (schist, sheared argillite, greywacke of Jurassic and Cretaceous age). Most of this unit's outer coastline consists of sandstone, siltstone, and conglomerate assemblages (Carmanah Formation), which are of Tertiary age (11 to 70 million years old) and bear more fossils than any other area of the park. Bivalve shells, well preserved crabs and foraminifera from 40 to 60 million years old have been found here. Small areas of limestone, marble and argillite are found on the southwest side of the Klanawa River and in the area of Nitinat Narrows.

The relatively soft, flat-lying sediments of the West Coast Trail have been uplifted and eroded to form a coastline composed almost exclusively of high, vertical cliffs fronted by a nearly flat, wave-cut foreshore bench sometimes more than forty metres wide. Sea caves, surge channels, sea stacks, tide pools and coastal waterfalls have been carved out of this coastline to shape spectacular landforms unique to the West Coast Trail and are an attraction for wilderness hikers and photographers.

These sandstone platforms and cliff faces are backed by large areas of the morainal till common throughout most of this unit. Along the coast, currents have transported unconsolidated materials southeastward and deposited them in bays and beaches. Sediments have also been blown ashore to form dunes along some portions of the foreshore. The largest sand deposits have developed at Keeha Bay, the head of Pachena Bay, and the mouths of the Cheewhat and Carmanah rivers.

Glaciation has been a major factor contributing to the landscape of Pacific Rim. The most recent glaciation reached its maximum 20,000 years ago. Southern Vancouver Island was covered by an ice sheet 300 metres thick which flowed in a south-southwesterly direction across the strait of Juan de Fuca, terminating at the edge of the continental shelf. Glacial and marine deposits of clays and gravels are found extensively throughout the park and are particularly evident in the area of Florencia Bay. In this area, surface sediments were deposited by meltwaters from the front of a glacier terminating one to several kilometres east of what is now the tidal coastline.

Sediments dumped into the sea by the ice include stratified silt, fine sands, clays and sometimes stones carried seaward by floating icebergs. Deltas of silty-clay sediments were deposited in shallow near-shore waters. Later, sand and gravel carried on the glacier,

or pushed in front of it, were deposited along the now-ancient meltwater streambeds. These unsorted drifts consist of clay, sand, gravel and boulders (morainal till) and are deposited extensively throughout Long Beach. Prior to park establishment, many of these sites provided a source of construction material.

Eventual deglaciation caused a global rise in sea level which amounted to about 100 metres in the park area. The ocean overtook the land and, at its highest point, submerged the Long Beach area except for the hilltops west of the Tofino Airport. Kennedy Lake became an inlet of the sea and the present hills and rocky knobs between Wickaninnish Bay and the lake were offshore islands. But submergence was not long-lived. Along with the melting of the ice sheet came isostatic rebound, a lifting of the land resulting from the removal of the heavy mantle of ice. Rebounding and tectonic uplifting have reclaimed up to 61 vertical metres of land establishing the shore levels of today, exposing deposits of sand and gravel, and forming marine terraces and wave-cut cliffs.

Geological processes are on-going. While the primarily subtle tectonic activities continue beneath the surface of the national park area, the more obvious geomorphological forces of wind and water sculpt the land surfaces. The movement of water, whether from wave action, tides or surface run-off, causes erosion and the transportation and deposition of bedrock and glacial materials. Shores are altered to form headlands and surge channels, sea cliffs and arches, sea stacks and caves. Fractures and fault lines are fragmented by wave surge; rocks broken away are churned and broken into smaller and finer particles to be deposited as cobble or sand beaches along the shores. Movement of winds lifts the finest particles from the beaches to form systems of dunes such as those at the southeastern section of Wickaninnish Bay and the beaches below Radar Hill. Sand berms along the shoreline where vegetation cover has been misused or damaged are most susceptible to the erosive action of on-shore winds.

High-energy waves constantly assault beaches and headlands of the outer coast. Sandy beaches follow a predictable cycle, with the winter removal of beach materials to offshore bars followed by spring and summer redeposition. Wave action separates the heavier and lighter sediments eroded from coastal cliffs, leaving strands of glacial boulder or cobble along stretches of otherwise sandy beaches. Active wave erosion of beach foreshore is highly visible in the Comber's Beach section of Long Beach.

Shoreline erosion is very noticeable on islands in the Broken Group receiving impact from high-energy waves. Only the outermost and seaward islands of Wouwer, Howell, and Cree, receive the full assault of Pacific waves and weather. While all islands are subject to shoreline erosion to some extent, the inner protected islands of Turtle, Walsh, Chalk, Brabant, Hand, Nettle and Mence are the least affected. Most beach areas within the Broken Group have developed on shorelines protected from the fury of Pacific systems.

Soil formation and soil type reflect a complex interaction of topography, climate, bedrock materials and vegetation. When determining the capability of a particular site to accommodate a proposed development such as a campground or hiking trail, soil properties (texture, degree of wetness, permeability, and slope gradient) must be considered. The saturated soils (ferric podzols) found in many areas of the park do not provide adequate sites for facility development. Wetness can greatly reduce a soil's load bearing capacity. Slope gradient will also affect soil stability and will limit development potential. Understanding the ecological interrelationship between soils and other environmental factors plays an important role in the management of national park resources.

VEGETATION

Within Pacific Rim National Park Reserve there are 2 general types of terrestrial vegetation, those found in the forest and those along the shore. Each is a reflection of its situation, its exposure to climatic and oceanic influences, soil development and stability, drainage, and landform contours. Within these two vegetation realms, there are a total of 441 different species of vascular plants within the park.

THE FOREST

The temperate rainforest of Pacific Rim is an obvious indicator of the environmental forces at work in the park. Wherever you look in the park, whatever the season, the dominating colour is green. Rich and lush, the forests of the park are divided into 6 communities contained within the Coastal Western Hemlock Biogeoclimatic Zone, representing one facet of the Northern Pacific Coast Forest. This old growth forest is known as one of the highest biomass-producing areas in the world.

Along the coastal edge, brushed by sea-spray, giant Sitka Spruce dominate the Spruce Fringe forest community. An understory of salal, black twinberry and shrubby Pacific crabapple fill in the inner forest. The most exposed shoulder of the spruce fringe is stunted by wind and spray, forming a distinctive, wind-sheared krummholz that buffers the inner forest from the full force of Pacific weather systems. Overseeing this deformed margin, lofty Sitka spruce standing 50 to 90 metres tall survey the sea.

The Cedar-Hemlock forest community is found further inland, where the ranks of salt-tolerant Sitka spruce thin, becoming outnumbered by western hemlock and western red cedar. Accompanying these conifers, there is an understory of red huckleberry, salmonberry, blueberry and salal. Distinctive and unique within this forest are "candelabra-like" red cedar. Stressed by strong winds, heavy rainfall, low nutrient conditions and a high water table, western red cedar struggles with the elements developing twisted trunks and multiple, gray-weathered crowns. Many of these trees are hundreds of years old, justly earning their silvered and wizened appearance.

Where soil depths and fertility are optimal, western red cedars and western hemlocks are joined by amabilis fir to form the Climax Rainforest community. This old growth forest supports a diversity of animals, many of which appear to be dependent upon its unique forest structure. Western yew, a small "cranky-looking" conifer, is scattered throughout this forest, along with salal, false azalea, blueberry and epiphytic (one plant growing upon another) mosses and ferns. It is characterized by an irregular, multi-layered canopy, giant conifers, standing snags, and fallen nurse logs with rooted seedlings.

The Wooded Bog community develops in areas with poor drainage. Stunted shorepine, a coastal relative of the erect interior lodgepole pine, grow among sphagnum moss, Labrador tea, and bog laurel. This community of plants is specially adapted to the wet, acidic conditions of the bog. Skirting this wet zone, evergreen huckleberry fills the transitional margin into other forest zones.

The Stream Banks and Roadside forest community is most distinctly represented by red alder. On flood-swept stream beds, cleared roadsides and logged ar-

eas, groves of alder become ingrown with shrubby willows, cascara, salmonberry and thimbleberry. The opportunistic scotch broom, introduced to Vancouver Island in 1849, has firmly established itself along roadways throughout the region. It's vivid yellow splash of springtime bloom delights highway users but is thought of in less endearing terms from a resource management perspective.
This hardy "alien" displaces native species.

There are some sections of disturbed forest within the park. These are areas of past human settlement and where forests have been commercially harvested before the land was set aside as a national park reserve. Douglas fir, amabalis fir and Sitka spruce were planted after harvesting, with western hemlock and red cedar regenerating on their own. The light-loving and fire-dependent Douglas fir artificially introduced to these areas, will ultimately be surpassed by the more shade-tolerant indigenous species. Eventually, the indigenous forest cover will prevail, never to be cut again.

Forest fires in the area of the park are rare due to the mild, wet climate. Abundant moisture retained within the soil and the debris covering the forest floor, keep the fire hazard to a minimum. Windthrow openings in the forest canopy act as the usual agent of forest rejuvenation in the absence of fire. The result is a forest structure of uneven age, providing diverse and varied habitat for wildlife in the park.

THE SHORE

The shores of Pacific Rim provide a diverse range of vegetative habitats. From the ocean's edge to rocky crevices and sand dunes, each community is adapted to the stresses imposed by its location.

Most beaches are either sand or cobble and can be divided into 3 beach zones: the forelog zone, the driftlog zone and the postlog zone. Storm winds and waves shift rocks and sand, affecting the distribution of plants in each zone.

The forelog zone is found between the open sand beach and the driftlogs. Vegetation is limited to clumps of sea rocket and sandwort in this area most subject to the action of tides and waves.

The driftlog zone is cluttered with an accumulation of logs and other flotsam deposited by tides and storms. Beach rye, beach pea and giant vetch grow among the logs furthest from the water's edge.

The postlog zone is more stable than the two preceding zones. It supports European beach grass and rye grass on its seaward side and Nootka rose, willows, black twinberry and salal as it leaves the beach and becomes the spruce fringe community. Within this zone some areas of sand dunes have developed. These areas, by contrast, are constantly changing. Root networks of mace-headed sedge and seashore bluegrass stabilize shifting dunes. Other vegetation such as yellow sand verbena and beach morning glory establish themselves in deeply-rooted, widespread clumps, contributing to the stabilization of dune systems. On its outer fringes, kinnikinnick, a mat-forming shrub, accumulates a layer of organic matter that forms the base for eventual soil development and a seedbed for the slow invasion of the adjacent forest community.

Along the shoreline, exposed rocky headlands and islets provide little soil substrate for vegetation. Plants establish themselves above the reach of tidal patterns but are still exposed to heavy salt spray and wind. Rock cracks offer refuge for hardy cinquefoils, plantains and thrift at the margins of the spruce fringe. Selfheal, sea thyme, nodding onions and beach strawberry commonly establish themselves in soil pockets, with scattered patches of yellow- and blue-eyed grasses, stonecrop and Indian paintbrush.

While shrubs are not common in this area, saskatoon berry, Nootka rose and salmonberry can be seen hugging the transition between rocky shoreline and forest. Tree cover is missing except for the occasional wind-stunted spruce or cedar high up on the rocks. In more sheltered regions between rocky headlands, silverweed, glasswort, and Baltic rush fringe cobble and shell-type beaches.

Salt marsh, where the land is periodically invaded by the sea, is dominated by grasses and sedges. Where the marsh is cut by stream and tide channels, mud flats host a rich profusion of eel grass. This grass is integral to the estuarine community, providing cover, food and habitat to a diverse array of marine organisms and significant populations of waterfowl.

Vegetation is a complex expression of environmental factors. In Pacific Rim National Park Reserve it is expressed as dense, multi-storied, uneven-aged forest communities and rich shore zones. Recognizing and understanding the communities making up this vegetative mosaic provide an appreciation for its uniqueness and guidance for its on-going protection.

WILDLIFE

Pacific Rim National Park Reserve supports a variety of marine and land-based (terrestrial) wildlife. Healthy wildlife populations depend primarily upon the protection of habitat. As areas outside the park become progressively altered by the activities of man, habitats within the park become important benchmarks of environmental change. Wildlife plays an increasingly important role as an indicator of healthy ecosystems.

The present assemblage of wildlife is believed to have established itself within the last 10,000 years. During the early stages of the last deglaciation, mainland animals were able to invade Vancouver Island. A lowering of sea levels and consequent narrowing of the channels that separated Vancouver Island from the mainland enabled several species to cross. Subsequent isolation of Vancouver Island contributed to the evolution of subspecies different from those on the nearby mainland. Salt water barriers are effective obstacles to the movement of some mammal populations. Distinct subspecies of cougar, mink and wolf suggests that these mammals have been resident on the island and separate from mainland species for quite some time.

Species diversity is reduced at each stage of isolation from the mainland. This is particularly true of mammals. For example, the coastal mainland of British Columbia has 48 native land mammal species; Vancouver Island has just 18, while the Broken Group Islands unit of the park has only 10 species. The introduction of new species since the post-glacial resurgence of sea levels has been attributed to animals rafting or swimming across channels, or deliberate and accidental introduction by man.

MAMMALS

Mammals are the most interesting, although least visible, wildlife within the park. The terrestrial mammals in Pacific Rim include blacktail deer, Vancouver Island wolf, black bear, raccoon, cougar, marten, mink, short-tailed weasel, river otter, Norway rat, deer mouse, red squirrel, wandering shrew, Townsend vole, and muskrat. Given the relatively small area of the land portion of Pacific Rim, and its linear configuration, the populations of the larger mammals are continuously moving in and out of the park reserve. This mobility makes it very difficult to manage these populations and requires a coordinated regional approach with adjacent land management agencies.

Historically, sea otters occurred along the entire north Pacific coast from Japan to the Aleutians and down the west coast of Canada to California. The otter pelt was in high demand by European fur traders in the 1700s and early 1800s, and the animal was virtually extinct by 1830. The last documented sighting of original sea otters in British Columbia occurred in 1929. Since then, Canadian and American government agencies have successfully reintroduced sea otters from the remaining Alaskan colonies to British Columbia in the Checleset Bay area on northern Vancouver Island. The original colony has split into two, both of which are growing at about 12% annually. It would appear that the southern colony is spreading further southward and may eventually recolonize park waters.

The most popular and most frequently sighted mammals in the park are the marine mammals, the seals, sea lions and whales. Most exhibit predictable patterns of movement and location, allowing park visitors good opportunities for viewing.

California sea lions, Steller's (Northern) sea lions, and harbour seals are common in park waters. Less frequently seen are Northern fur seals and Northern elephant seals. Sea Lion Rocks, just offshore from Comber's Beach in the Long Beach unit, is one of only 4 year-round haul-outs for Steller sea lions on the west coast of Vancouver Island. It provides visitors an excellent opportunity to observe sea lions in their natural setting. The Broken Group Islands and the West Coast Trail also have predictable haul-out areas for sea lions, although populations at these sites fluctuate seasonally.

Although Gray whales have been sighted throughout the year, they are most predictably seen during the spring migration as they journey north through park waters. The peak season for watching Grays is mid-March to mid-April when the villages of Ucluelet and Tofino welcome visiting whale watchers at their annual Whale Festival. This population of whales has made an impressive comeback from virtual annihilation by commercial whalers during the early 1900's. The hunt was abandoned when the herd became so depleted that pursuit was no longer financially viable. Only a few hundred survived. Since that time, the Pacific herd has increased to more than 16,000 whales, gaining international protection in 1947. These whales represent the only significant population of Gray whales left in the world.

Killer whales are seen throughout park waters, although not as frequently as Gray whales. They are easily identified by their distinctive colouration and high dorsal fin. Sleek and awesome, it is the killer whale that most visitors are familiar with and hope to see. Many other species of whales, such as humpbacks, sperm whales, and a variety of porpoises and dolphins, are known to be in or adjacent to park waters.

BIRDS

Approximately 250 species of birds, mostly spring and fall migrants, have been identified within the park and bordering areas. Pacific Rim intercepts thousands of birds on their migratory journeys north and south. The diverse habitats available within the park, including sandy shores, rocky beaches, vertical cliffs, offshore islands and quiet estuaries and forests, offer attractive sites for bird populations. In Pacific Rim, birdwatching activities tend to be concentrated along the shorelines, rather than the forests where thick vegetation often interferes with successful sightings. Quiet birds are not easily detected amongst the dense tangle of the rainforest. The best birdwatching coincides with seasonal migrations.

The numbers and types of birds seen in the park vary throughout the year. In January and February, resident and winter birds can be seen in their respective habitats. Loons, grebes and ducks (scoters, scaup and buffleheads) are on the water at this time. Winter wrens, song sparrows, and dark-eyed juncos are frequently seen in or along the forest fringe. Diving ducks and gull populations increase during March to take advantage of large schools of herring spawning in local waters. Varied thrush, juncos, and song sparrows increase their numbers during this time.

Most winter birds have left by April or May with the arrival of spring migrants and summer residents. In Pacific Rim, bird populations are lowest in June. By early to mid-July migrating shorebirds begin to line the beaches, and their numbers peak by August. September and October see the return of some winter species, with only a few fall migrants left in the area by the beginning of November. Common goldeneye and trumpeter swans arrive in the park near the end of each year.

Pacific Rim has a variety of breeding resident birds. Red-throated loons, Brandt's and pelagic cormorants, great blue herons, bald eagles, black oystercatchers and glaucous-winged gulls represent a sample of the sea and shore species breeding in the park. Steller's jays, pileated woodpeckers, chestnut-backed chick- adees, golden-crowned kinglets, winter wrens, brown creepers, and red crossbills represent the forest breeders. Altogether there are 54 breeding residents in the park reserve, there are an additional 36 species that winter elsewhere but come into the park just for breeding, including tufted puffins, rhinoceros auklets, Leach's and fork-tailed petrels, band-tailed pigeons, marbled murrelets, rufous hummingbirds, Swainson's thrush and orange-crowned warblers.

REPTILES

Most people associate reptiles with tropical or subtropical areas, but several species are present in Pacific Rim. The most commonly seen reptile is the garter snake. This snake is wide-spread in North America and the most cold-tolerant. The garter snake feeds mainly on amphibians and earthworms, along with some intertidal and fresh-water fishes, leeches and small birds. The Puget Sound red-sided garter snake, a subspecies of the common garter snake, is also known to reside in the park.

Another resident snake is the northwestern garter, a terrestrial snake that prefers open areas along estuaries and coastal beaches. It seldom enters the water and feeds mostly on slugs and earthworms. The western terrestrial garter snake is present in the park as well. Despite its name it is an aquatic snake, having the most varied diet of slugs, small mammals, fish, leeches, earthworms and even other snakes.

Pacific leatherback turtles are a subspecies of the world's largest living turtles. These giant marine turtles are considered an endangered species by many. Specimens and sightings of the Pacific leatherback have come from park waters and adjacent beaches.

AMPHIBIANS

From water-filled ditches and catchments throughout the area, the park's most audible amphibians serenade springtime visitors. The Pacific treefrog spends most of its time toe-padding the wet lengths of branches and shrubs in the temperate rainforest. During spring breeding, treefrogs descend to the forest floor and into the water to join a cacophony of frog symphonics!

Red-legged frogs are also resident forest-dwelling amphibians. They flourish in damp coastal forest and never venture far from standing water. Red-legged frogs, like Pacific treefrogs, are members of the spring breeding chorus. Their low-pitched croaks are sung underwater and may not be noticed under the din of the more vocal treefrogs.

Rough-skinned newts and northwestern salamanders are found among the decomposing deadfall and leaf litter characteristic of coastal forests. Also resident, although not as dependent on wet environments, are terrestrial western red-backed salamanders. Still requiring moisture, they can be found under fallen logs and mosses in damp, but not wet, locations. Another resident amphibian is the clouded salamander. It is a very nimble tree-climber, most active at night.

FISH

Within the park reserve, there is little diversity of fresh-water habitat. Most habitats are fast-flowing mountain streams with little variety of bottom sediments. With fewer habitats available, fewer types of fish are found. Eight species of fish have been identified from lakes and streams within the park: cutthroat and steelhead trout, Dolly Varden char, sockeye and Kokanee salmon, chum and coho salmon, coastrange sculpin, prickly sculpin, threespine stickleback, and the Pacific lamprey. Aside from the fish, it is interesting to note that fresh-water shrimp have been found in Kennedy Lake and Lost Shoe Creek.

Marine fish are much more numerous and diverse. There are approximately 200 different species in the tidal waters of the park. Beached specimens and sightings indicate that an additional 100 species are accidental (out of range) visitors to the park.

Pacific salmon are well known in the park area. Commercial and sports fisherman operating out of coastal communities adjacent to the park prize local runs of chinook, coho, pink, chum and sockeye.

There are many types of rockfish with fanciful names: Yellowtail, Canary, China, Quillback and Tiger, to name a few. Sculpins are abundant. Like rockfish, sculpins are primarily bottom-dwellers, with most preferring a rocky substrate. Greenlings and sea perch are abundant. Great schools of herring are the focus of much commotion in the early spring when numerous marine predators, birds and man intercept them en route to the spawning shallows. Sticklebacks and pipefish inhabit beds of eelgrass. Spiny dogfish are common to the area and often plague the lines of local fisherman. From time to time, skates are sighted. Their egg cases are curiosities with inquisitive beachcombers who encounter them along the tidelines of park beaches. Cod, flounder, sole and halibut are found in park waters, as well as ferocious looking wolf eels and ratfish.

The wildlife resource of Pacific Rim National Park Reserve is considerable. The diversity of habitat, from land and sea, accounts for a myriad of wildlife species.

THE MARINE ENVIRONMENT

Of all the wildlife found within Pacific Rim National Park Reserve, the most abundant and diverse is undoubtedly found in the nearshore marine environments. The marine components of Pacific Rim include the offshore waters to the 20 metre depth contour adjacent to the Long Beach and West Coast Trail units and the waters within the Broken Group Islands.

The open ocean is home for a myriad of lifeforms, including whales, fishes, birds and, potentially, creatures still waiting to be discovered. The ocean controls our weather and moderates our climate. Its undersea mountains are higher and its trenches deeper than anything in our terrestrial world. It provides the nourishment, directly and indirectly, that sustains the life of the planet. Reluctant to give up its mysteries, it is the source of legend and myth.

Skirting the shores of the park, the waters over the continental shelf are the richest component of the marine environment. This region is inhabited by a multitude of organisms, from leviathan whales and varieties of fishes, to the tiniest of microscopic plants and animals. This water column closest to the continent is rich with nutrients and life. Deep waters upwelling into the shallows seasonally recycle materials to the surface where they combine with river runoff and sunlight to provide a rich and nutritious "soup", fueling the food chains of our planet.

The park's intertidal zone, where waters are tugged between land and sea, is divided into distinct "bands" of marine life. Associated with each band are characteristic assemblages of plants and animals. These patterns are orchestrated by various environmental factors: wave exposure, the type of substrate and tidal range. The ebb and flow of the tide alternately exposes and floods life within these bands to varying degrees. Only the species that can adjust to the extremes imposed by tidal fluctuations will survive.

The lack of grinding winter ice against Vancouver Island's rocky shorelines, has also contributed to the establishment of one of the world's richest intertidal areas.

The highest level, the splash zone, is misted with wave spray and rarely flooded. Closer to the sea, and submerged by tides about 10% of the time, is the high intertidal zone. Regions covered by tidal waters for 50% of the tidal cycle constitute the middle intertidal zone. The low intertidal zone is inundated by the sea 90% of the time. These tide-washed "gardens" are represented by a variety of predictable species.

The splash zone is home to lichens, isopods (pill bugs), periwinkles and some hardy plants. Acorn barnacles typically delineate the highest margin of the high intertidal zone, followed by bladder wrack (a type of seaweed), limpets and purple shore crabs. Beds of mussels and gooseneck barnacles crowd the middle intertidal zone, along with sea sac (a seaweed) and ochre seastars. The lower intertidal zone displays a profusion of life. Its colourful tapestries carpet the bottom of deep tide pools with purple sea urchins, green anemone, pink coralline algae and iridescent seaweeds. Lower still, the rocky subtidal regions are dominated by larger kelps. Beyond a depth of 30 metres, these kelp beds disappear. But intertidal zonation is not so easily defined as that. A site's exposure to wave energy and the makeup of its substrate influence the distribution and abundance of expected species.

Almost all of the park's coastline is exposed to heavy surf. Rocky headlands broken by sand or gravel beaches make up most of the shoreline. Subtidal areas are predominately sand, especially below 12 metres, where a sandy plain extends for many kilometres offshore. Mud bottoms develop in protected bays or in channels protected from strong currents.

LONG BEACH UNIT

There are 6 basic marine communities in the Long Beach unit of the park.

The exposed, sandy community dominates Long Beach and Florencia Bay. It supports relatively few species, although some in very large numbers. Razor clams are commonly found on exposed intertidal sands along with marine polychaete worms and purple olive snails. Bloodworms and beach hoppers inhabit the upper intertidal zone.

Exposed and semi-protected, rocky communities are not as abundant in the Long Beach unit as in other units of the park, but offer visitors the greatest diversity in terms of visible intertidal life.

Protected, rocky communities (Grice Bay and some very limited sites on the Pacific side of the Long Beach unit) consist mostly of barnacles, bladder wrack, sea stars (asteroids) and snails (gastropods). Several species of algae, such as feather boas, sea brush and sea cabbage, provide shelter and protection for black turban snails, limpets, urchins and several chitons.

Exposed, rocky subtidal communities can vary in terms of species and numbers. The majority of species of sponges, anemones, abalone, byrozoans, marine worms and sea squirts are fixed to the bottom and filter nutrients directly from the water column. Preying upon these stationary residents are sea urchins, crabs, snails and sea slugs.

The protected, mud bottom community is restricted to Grice Bay, being almost unique in the context of the Long Beach unit. Here, the major intertidal animals are Dungeness crabs, ghost shrimps and clams. Beds of eel grass in the intertidal and subtidal areas harbour juvenile fish such as perch, pipefish, blennies, as well as nudibranchs (sea slugs), and turban snails. It is also home for mud-dwelling worms, crabs, and cockles. Migratory birds, raccoons and bald eagles are commonly seen foraging on the mudflat and Gray whales have been observed feeding on bottom-dwelling crustaceans in the bay.

BROKEN GROUP ISLANDS UNIT

The complex shoreline of the Broken Group Islands has the greatest diversity of marine communities within the park. Every Long Beach unit habitat is represented here, as well as at least 3 other communities.

Semi-protected and protected, rocky intertidal communities are dominated by black turban snails, limpets, and wrinkled whelks, accompanied by barnacles and seastars. Several species of algae, dominated by bladder wrack, drape the middle and high intertidal areas, where reduced wave action allows a wide shoreline cover of algae. Wrinkled whelks feed extensively on barnacles. Ochre seastars consume the barnacles and wrinkled whelks along with other delicacies, such as small limpets, mussels and chitons. These, in turn, graze on the extensive algae. Bat stars and moon snails are abundant.

Within semi-protected and protected subtidal habitats, species diversity is usually lower than in more exposed, subtidal habitats. The major occupants in these communities are rock jingles, plumose anemones, and barnacles. Brown turbans, top shells and sea cucumbers are more common here than in rocky, subtidal areas. Sea stars are large and numerous.

In the Broken Group there is a variety of protected, intertidal beaches. These beaches are made up of either mud, sand, or gravel-cobble. While their substrate may be physically different, their marine life may be similiar. Where the footing is solid, barnacles are plentiful and preyed upon by wrinkled whelks. Gravel-sand foundations support a variety of species of clams: little necks, horse, and butter. Common and abundant in all these habitats are bat stars and moon snails, and an assortment of marine worms.

The protected, subtidal regions vary according to bottom composition. Muddy, subtidal areas are dominated by marine worms and brittle stars. Larger seastars are wide-spread, but scarce. Sand and gravel subtidal regions have fewer brittle stars. In their place are burrowing anemones and snails. Large pink seastars and sunflower stars prey on a diversity of resident clams.

WEST COAST TRAIL UNIT

The West Coast Trail is delineated into 3 habitats, and the distribution of marine life along its shoreline reflects a gradient of environments, from exposed open ocean to the more protected waters inside Juan de Fuca Strait.

Exposed, coarse sand or gravel beaches are much steeper and narrower than those in the Long Beach unit. They support few species as a result of shifting substrate and constant grinding surf action.

The exposed, rocky areas of the West Coast Trail are similiar to those of the Long Beach and Broken Group Islands Units. The main difference is a greater abundance of purple urchins and fewer gooseneck barnacles.

Semi-protected, intertidal communities are similiar to those at Long Beach. Bladder wrack is less common, replaced by an assortment of green algae that form extensive beds in the high intertidal zone. Associated with these algae are periwinkles and limpets. Tidepools and crevices host large numbers of purple sea urchins.

For thousands of years, the marine environment of Pacific Rim National Park Reserve, like all coastlines of the world, has lured humans to the land's edge. Here we have found abundant resources and a favourable climate. Its beauty and mystery continue to attract us.

CULTURAL HISTORY

British Columbia's recorded history began with European explorers searching for the legendary Northwest Passage to the Orient. It was on the west coast of Vancouver Island, just 96 kilometres (60 miles) north of the Long Beach unit of Pacific Rim National Park Reserve, that Captain James Cook of the British Navy first set foot, in 1778, on the land now called British Columbia. Captain James Barkley followed in 1787, arriving in Barkley Sound in search of sea otter pelts. But Cook and Barkley were not the first men to perceive this land's wealth. Archaeological evidence indicates the presence of man along this outer coast of Vancouver Island for at least 4,300 years. The oral histories and knowledge of the legends of the Nuu-chah-nulth claim they have been here since the time the world was created.

The cultural resources of this park are based on evidence of man's presence derived from 3 sources: archaeological site surveys; oral histories (family stories and observations, passed from generation to generation by knowledgeable native elders); and written and pictorial documentation compiled since first European contact.

Within Pacific Rim approximately 290 native archaeological sites have been identified so far. These sites represent the physical evidence of man's involvement in resource extraction (shellfish processing stations, bark-stripped trees, fish traps, felled trees for canoe-building) or indication of previous village sites and camps, often in the form of midden development (earth knolls built from a layering of soil and accumulated village refuse) and fallen structures. Investigation of all these sites provides valuable clues into the lives and culture of the people who lived there.

Most of what is known about past population estimates, composition and territories of local native groups is based upon the knowledge of elders and observations of others recorded over the last two hundred years. Within and surrounding the area now known as Pacific Rim National Park Reserve, populations are estimated to have been over 9,000 people at the time of first European contact. Twenty-three independent native groups held traditional territories with 21 main village sites scattered throughout the 3 park units. Today, these 23 independent groups are survived by just 6: the Sheshaht, Ucluelet, Clayoquot, Ohiaht, Ditidaht and Pacheenaht. This dramatic decline is attributed to a number of factors.

Before European contact, these native groups were a rich people compared to many contemporary native groups of North America. Their focus was the sea and the forest, which provided sustenance in the form of food, shelter and clothing, and spiritual associations. Their livelihood was based on the immediate environment. The forest provided foodstuffs, both plant and animal. Western red cedar met a diverse range of their needs: bark for the weaving of clothing, blankets, containers, planks, posts and beams for long house building and material for dugout canoe construction. The sea was a transportation network as well as an abundant source of provision. Salmon, cod and halibut were caught for immediate use or dried for winter provision. Marine mammals, including sea lions, seals and whales, were sought for food. Everything was utilized, including their hides, oil and bones. Marine mammals, along with other animals, played important spiritual roles within the native culture in addition to providing direct sustenance. This bountiful environment enabled the native people to develop a rich and complex society.

Dramatic and profound changes to all aspects of native life occurred after contact with European explorers and traders: changes in population and group compositions, and in patterns of subsistence and settlement. With the foreign traders came epidemics of infectious diseases, smallpox, measles, tuberculosis, and dysentery, against which the native people had no defence. Having no knowledge of quarantine, individuals tried to escape by fleeing their villages only to carry the disease into other populations.

The mortality caused by internal warfare and epidemics was devastating. In the relatively short period of eighty years, the native populations of the west coast dropped by an estimated 75 to 90 per cent. The result was a disruption, re-alignment, or total disappearance of previously distinct political groups.

Traditionally, tribal groups lived year-round at a village site, taking advantage of the diversity of resources available within their defined territories. These original territories became enlarged with the amalgamation of disease-reduced populations or annexation through conquest. New seasonal patterns of settlement and subsistence developed to take advantage of these acquired resources, such as better salmon streams, defensive sites, or improved beach access within their enlarged land base.

In the late 1800's native groups began to pursue new economic opportunities provided by increasing numbers of settlers. The production of dogfish oil, dried halibut and salmon, and offshore sealing further altered traditional life patterns. These new wage earning opportunities occurred most often in the spring and summer, leaving only the fall for traditional pursuits. Tribal village sites became established closer to the trading centres of white settlers. Flour, sugar, tea, molasses and potatoes purchased from these settlements supplemented salmon as the major food resource, displacing traditional dependence on native use of berries, root plants and other food sources.

Initially settlers trickled into the west coast area with the trading posts associated with the fur trade and the whaling industry. Eventually, coast forest and fishing resources were also exploited, creating more industry and employment and sparking the interest of potential homesteaders. A prosperous export lumber trade developed. In the late 1800's minerals were discovered in the surrounding hillsides and in the gold-bearing sands of Florencia Bay, now within the park. At the turn of the century the vast stocks of salmon, halibut, cod and herring triggered the formation of a fishing industry. Salmon fishery became the most valuable fishery on the west coast. Canneries, fish buyers and processing plants for a variety of species were established throughout coastal areas. These industries continue to be major employers for the communities adjacent to park lands.

In the days of the sailing ship the west coast of Vancouver Island developed a history of shipwrecks. Since 1803 over 240 ships have foundered along this its reputation as the "Graveyard of the Pacific". The government of the day made several efforts to reduce this carnage. A manned lighthouse was built at Cape Beale in 1874 to warn ships away from the dangers of this coast. Then the West Coast Telegraph was constructed between Victoria and Cape Beale and was completed in 1890, along with a second lighthouse at Carmanah Point.

Following the tragic wreck of the passenger steamer, Valencia, in 1906 with 126 lives lost, the original telegraph line connecting the west coast with the outside world was further developed to become the "Lifesaving Trail". Construction of the third lighthouse at Pachena Point, near the wreck site, began the following year. Ultimately, the Lifesaving Trail was only pushed through from Bamfield to Carmanah Point, with down-grading along the way, as costs proved prohibitive. Beyond Carmanah the trail remained the original primitive telegraph line. These developments helped to save many lives as shipwrecks continued to occur with regularity.

After the 1940's, with the development of more sophisticated navigation equipment eclipsing the technology of the past, trail maintenance was discontinued . Today the trail is known as the West Coast Trail and, having undergone a major redevelopment by the Canadian Parks Service in the 1970's, is one of the best known and most challenging hikes in North America.

During World War II a large airfield was built on land now surrounded by the Long Beach unit of the park. As a result of this military installation, a road was built connecting the two communities of Tofino and Ucluelet. In 1959 the Long Beach area was

linked to the outside world with the opening of Highway #4, though not with a hard-surface road until 1972.

The lands within the park, and each of the communities that surround it, tell intriguing individual stories of human settlement and development. Their histories weave together to form the fabric of today's society, and the eventual establishment of these lands as part of the Canadian National Park System was brought about, in part, by the recognition of their unique heritage value. The histories of the Nuu-chah-nulth people and the saga of foreign settlers have left their mark on the landscape. The imprints of this history represent a valued park resource, integral to understanding and appreciating the varied heritage resources of the land now called Pacific Rim National Park Reserve.

H.M.C.S. THIEPVAL
ROKEN ISLANDS GROUP

SECTION III: PARK VISITORS, ACTIVITIES AND TRENDS

Every national park faces a challenge of balance. Established to protect outstanding representations of Canada's natural and cultural heritage, national parks must also provide for their appreciation through visitor education, use and enjoyment. A park's provision for recreational activities, facilities and services must always be weighed against the promise to maintain the ecological integrity of park resources for suceeding generations of Canadians.

Pacific Rim National Park Reserve is experiencing record high levels of visitation. In 1990, nearly 650,000 people visitied Pacific Rim National Park Reserve. Although the vast majority of park visitors never experience the Broken Group Islands or the West Coast Trail units, these areas are wild and relatively remote and cannot, in fact, accommodate high levels of use. The following discussion addresses past and present visitation patterns in the three units of the park, and the range of visitors activities and services available in them.

THE LONG BEACH UNIT

With the highway improvements to the Long Beach area that occured in the early 1970s, access to this part of the park is now relatively easy. The availability of facilities and services, both in the park and in the adjacent communities of Ucluelet and Tofino, are attracting a steadily increasing number and range of visitors. Visitation to Long Beach has grown 35% in the past 5 years.

OUTDOOR RECREATIONAL ACTIVITIES AND SERVICES

The largest numbers of visitors to Long Beach come primarily for sightseeing, day hiking, beachcombing and organized (versus primitive) camping. Opportunities for natural and historic interpretation and appreciation also attract visitors. Contact with the park's environment, learning and intellectual stimulation, and the observation, study and photography of birds, wildlife, marine mammals (particularly Gray whales), and intertidal life are some of the benefits sought by park visitors. Other visitors take advantage of heavy surf conditions. Wave and wind surfers, along with surf kayakers, race coastal breakers along the lengths of sandy beaches. Many come simply to relax and enjoy the beaches.

Park facilities and services have been developed in response to the variety of recreational activities available at Long Beach. Provisions are planned to compliment these activities and provide for visitor enjoyment, education and safety, tempered by the need to protect and maintain the ecological integrity of park resources.

Walking the beaches, headlands and woodland trails is the best way to enjoy the Long Beach unit. Long stretches of sandy beach and rocky intertidal areas invite investigation. A system of 8 short hiking trails has been constructed to explore the variety of forest communities represented in the park. These trails are either woodchip or boardwalk surfaced, eliminating the need for any specialized footwear. Three of the Long Beach trails are self-guiding, with either on-site interpretive signing along the length of the trail or an interpretive brochure available at the trailhead.

Overnight visitors to Long Beach may stay in hotel, motel or bed and breakfast accommodations outside the park in the communities of Tofino and Ucluelet or camp in one of the 9 private camp- grounds available in the area.

There are 2 campgrounds within the Long Beach unit of the park. The 94 site Greenpoint Campground is a drive-in camping area suitable for tents, trailers, and R.V. units. It is semi-serviced and operates year-round on a first come-first served basis. Greenpoint is at or near capacity from Easter to Thanksgiving.

There has been a gradual increase in the number of vehicles registered at Greenpoint each year and this increase is attributed to visitor use spreading into the shoulder seasons, especially the spring, to take advantage of the local whale-watching festival. Use is also increasing in the fall to take advantage of lower traffic volumes and pleasant west coast autumn weather.

Campers surveyed within the Greenpoint campground in 1985 overwhelmingly reported that they were very satisfied with their camping experience. But the issue takes an entirely different twist if approached from the perspective of one who was not able to obtain a site within the national park, and the survey results clearly demonstrated a high level of frustration with the camping situation in Pacific Rim.

The implementation of a numbered waiting list system during the summer of 1989 was an attempt to relieve some of the visitors' frustrations. This system gives all potential campers an equal opportunity for receiving a site and eliminates the overnight line-ups of the past. This approach seems to have been viewed positively by the visitor and will be continued.

The Canadian Parks Service undertook a second major survey of park visitors in 1989 in all three units to learn more about visitor characteristics, motivations and levels of satisfaction. The results of this survey are included in the second newsletter.

BACKGROUND INFORMATION

Schooner Walk-In Campground is a primitive, hike-in area for beach tenting located on the northern end of Long Beach, adjacent to Schooner Cove. There is space for about 80 tents. Schooner is open from mid-May to late September with fresh water and pit privies provided.

There are three major day use areas in this section of the park: Wickaninnish Beach, Comber's Beach and the northern end of Long Beach, all part of the sandy stretch of beach known collectively as Long Beach. These areas provide washroom facilities for the visitor (including wheelchair accessibility) and, in the case of the Wickaninnish day use area, a changeroom facility. Picnic tables, outdoor taps, public telephones, information bulletin boards and trail access onto the beaches are available adjacent to the major parking lots in these areas. Wickaninnish and Long Beach day use areas each have a wheelchair accessible beach access, picnic areas and toilet facilities. Day use access is also available to Florencia Bay.

Beach activities range from shoreline walking and wading to skim-boarding and surfing. Ocean water is very cold and currents can be strong. Hazards and public safety concerns are identified through signing, park publications and educational programs. Surfguards are on duty at the Long Beach day use area daily during July and August.

Grice Bay, a protected tidal inlet, is popular for boating and birdwatching. The waters of the bay are relatively calm, making it the best local area for novice canoeing and kayaking. A hard-surfaced boat launch is available at Grice Bay.

Radar Hill Viewpoint is situated northwest of Long Beach. With road access to the top of Radar Hill it is a popular place to visit. At about 122 metres above sea level, this viewpoint provides panoramic views of the Estevan Coastal Plain, the mountains of the Vancouver Island Range and the Pacific Ocean with the fishing fleets in the distance. A cantilevered viewing platform facilitates wheelchair access to view the expanse of the ocean and the rainforest wilderness below.

A small day use area is also located on the southwest shore of Kennedy Lake. With road access available from Highway #4, this site provides a sand beach with warm fresh water swimming, a rare treat in the Pacific Rim area. The site is equipped with pit privies, change rooms and a water supply.

The section of Highway #4 (Pacific Rim Highway) that passes through the Long Beach unit has a narrow paved shoulder with limited suitability for bicycling. This shoulder is absent from secondary park roads and most roads outside the park's boundaries. Within the park, broad expanses of sand beaches during a lower tide provide enjoyable biking opportunities. Bicycles are not permitted on park trails.

Visitors to national parks enjoy opportunities for plant and animal observations, and the Long Beach unit of Pacific Rim is no exception. Whales, sea lions and seals are frequently seen and have become a major focus for tourism in the area. Many opportunities for whale-watching, sightseeing, and nature tours exist in the communities adjacent to the park.

Within the park, telescopes for viewing marine mammals are available in various locations for free public use. Black bears and black-tailed deer, while more elusive, are also viewed by many park visitors. The tidal pools and shorelines of Long Beach have a variety of marine plants and animals that intrigue beach explorers. Walking the park's trail system exposes visitors to the plant and animal inhabitants of old growth rainforests and other forest communities.

Winter activities do not vary greatly from summertime activities. Snow is uncommon in the park area because of the mild, maritime climate. Camping and hiking trails in the Long Beach section are accessible year round. Heavy winter storms, gale-force winds and driving rains make winter visits to the park a unique and exciting experience.

IINTERPRETATION AND INFORMATION

To compliment what the visitor has seen or may see and to learn more about the natural and human history of the park, free interpretive programs are scheduled daily from the end of June to the first of September. Interpretive programming is either personal (programming presented directly to the public by a park interpreter) or non-personal (printed materials, signing, displays). The Wickaninnish Centre and the Greenpoint Theatre are focal points for Pacific Rim's interpretive programming. Both facilities are accessible to the disabled.

The Wickaninnish Centre is located at Wickaninnish Beach, on the southern end of Long Beach. It offers visitors a glimpse into the earth's largest and deepest ocean. Exhibits, murals, on-site interpretive talks and a variety of films help visitors learn about the open ocean. A restaurant, operated by private enterprise, is located in the centre. The Wickaninnish Centre's hours of operation vary according to the season.

Attendance at the Centre has almost doubled since its inauguration in 1984. For the most part, visitors' response to the Wickaninnish Centre has been favourable. Of any negative comments received, most were received during its first year of operation. Since that time, the park has worked toward improvements. During the winter of 1991-92, the Centre's interior will be re-designed to better meet its educational objectives and the needs of the visitor.

Greenpoint Theatre is an indoor interpretive theatre located adjacent to the Greenpoint Campground. Evening interpretive presentations and introductions to daytime outdoor events run during the summer months.

Besides the Wickaninnish Centre and the Greenpoint Theatre, the park's personal interpretive programming provides visitors with a variety of services. Guided walks are conducted by park interpreters and are held on shoreline or in forest environments. On-site talks use the surrounding environment, props, and audience participation to deliver a "story" related to a particular site. Other personal programming includes roving interpreters meeting the visitor throughout the park, special group programs for local clubs and classrooms, and extension programs throughout the region.

Park programming also includes interviews for radio and television, and articles for magazines and newspapers. It includes photo displays in some park facilities and the production of interpretive pamphlets and on-site signing.

The park 's Visitor Services staff provides information services in addition to the educational facilities and services provided by interpretive programming. The Long Beach Information Centre provides an orientation to the park and its surrounding area. Personal assistance, interpretive program information and exhibits, park pamphlets and reference lists for adjacent community services are available to visitors to this centre. Information staff also respond to mail inquiries. The cente is open seasonally from mid-March until mid-October.

In addition, park visitor services provide external information centres and tourism agencies with information about the park and its region through ongoing liaison.

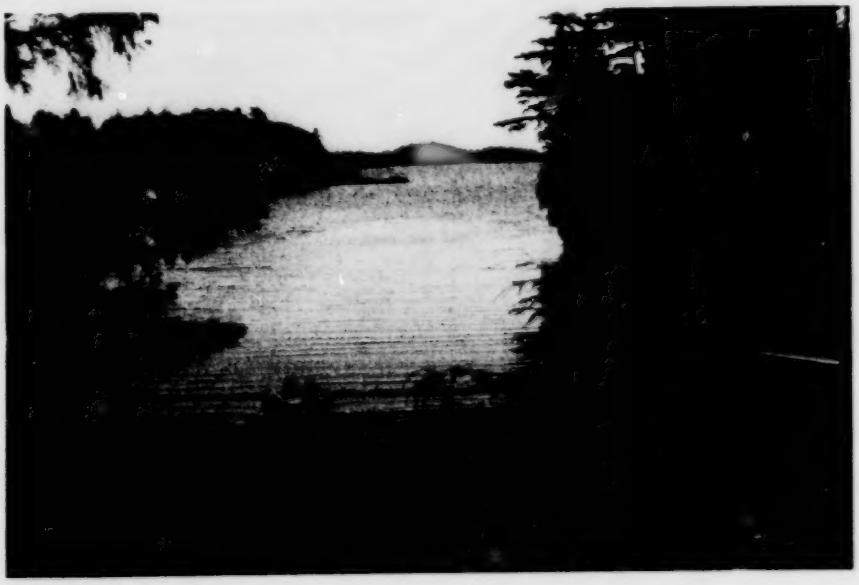
THE BROKEN GROUP ISLANDS UNIT

The Broken Group Islands are the focus for canoeing and kayaking in the park. Increasing use of the area is attributed to the increased awareness that the Broken Group is a relatively safe and beautiful place for ocean paddling, and to the continuous external publicity the area is receiving. Paddling in the Broken Group Islands provides personal challenge in a wilderness setting, away from high-density organized camping typical of many more accessible regions.

The Broken Group Islands are accessible only by boat and are relatively isolated in the centre of Barkley Sound. Distances to land vary from approximately 6-13 kilometres from the nearest communities of Ucluelet and Bamfield and the access point at Toquart Bay. Further, they are separated from these mainland communities by wide and potentially dangerous stretches of water open to the Pacific Ocean, and crossings are not recommended for small craft.

There is a scheduled ferry service to the Broken Group Islands from Port Alberni and Ucluelet aboard vessels operated by Alberni Marine Transportation Ltd. Approximately 50% of all canoes and kayaks in the Broken Group Islands access the islands from the B.C. Forest Service campsite at Toquart Bay. Recreational cruising by motorized and sailing vessels is also a very popular activity in, and mode of access to, the Broken Group Islands.

The isolation and relatively difficult access for small craft has been an important factor in allowing the Canadian Parks Service successfully to manage the Broken Group Islands as a wilderness area for the last two decades. In recent years, however, substantial increases in the popularity of coastal cruising, canoeing and kayaking, have put additional pressures on the Broken Group Islands, and the wilderness values of this environment are showing distinct signs of stress.



EXISTING FACILITIES AND SERVICES

Consistent with the wilderness management philosophy applied over the last two decades, the Canadian Parks Service has provided only very limited and semi-primitive facilities and services in the Broken Group Islands. Camping is currently limited to eight designated semi-primitive sites located on an equal number of the larger islands: Gilbert, Clarke, Dodd, Hand, Willis, Benson, Turret and Gibraltar islands. Pit privies at these sites are now the only structural facilities in the islands; the old cabins on Jaques and Clark islands have been removed as they constituted a safety hazard. Surface water supplies are available on several islands, some of which have been improved to produce a more reliable supply. These sources of water are, however, intermittent and require treatment to make them potable.

There is currently no charge for visiting the Broken Group Islands or for the use of park facilities. The level of service provided to the park visitor in the Broken Group Islands is limited to the provision and maintenance of the eight campsites and the presence of the Warden in the event his assistance is required.

A floating warden station, manned during the summer months, is located in a sheltered bay on the southwest shore of Nettle Island. Here, emergency help and information may be available. The park warden roves the entire Broken Group Islands area, not keeping regular hours at the warden station, and normally makes contact with visitors at campsites and anchorages.

Island exploring gives visitors contact with a variety of marine mammals, birds, and intertidal life. Gray whales can be encountered even within the inner islands. Wouwer Island's offshore reefs are popular seasonal haulouts for sea lions, giving island boaters predictable viewing opportunities. Island explorations, once on-shore, usually concentrate on shoreline investigations of tide pools and island perimeters. There is a small network of rough trails on Benson, Clarke, and Hand Islands, but hiking opportunities in the Broken Group have not been developed.

INTERPRETATION AND INFORMATION

There are no personal interpretive programs in the Broken Group Islands. Non-personal interpretation exists in the form of on-site signing at campsite locations and information on the reverse side of Nautical Chart #3670. This marine chart was co-operatively produced with the Canadian Hydrographic Service to commemorate the National Parks Centennial in 1985 and includes park information specific to the Broken Group on one side and nautical information for boaters on the other.

Information services for the Broken Group Islands is handled through the Long Beach unit's facilities. Pre-trip information for preparation and access to the Islands is available for mail-out upon request.

PAST AND PRESENT TRENDS IN VISITOR USE

Camping

As canoeing and kayaking, and boating in general, increased in popularity in the Broken Group Islands, so did the use of campsites. Planning studies in the late 1970's and the early 1980's identified significant increases in the use of the Broken Group Islands by recreational paddlers, in particular, but also by recreational boaters. Annual increases in paddling and the use of island campsites in the range of 30-40% were experienced in 1986 and 1987. The growth in camping is directly linked to the growth in paddling popularity. This trend is expected to continue into the mid-1990s before levelling off. The average length of stay for paddlers in the Broken Group Islands is 4 days.

Canoe and kayak paddlers collectively account for 94% of the users of the Broken Group Islands campsites. It is also interesting to note that in 1973, canoes and kayaks accounted for 7% of all vessel traffic in the Broken Group Islands; this figure had risen to 47% by 1978. Today, canoes and kayaks collectively account for 70% of all the vessel traffic in the islands.

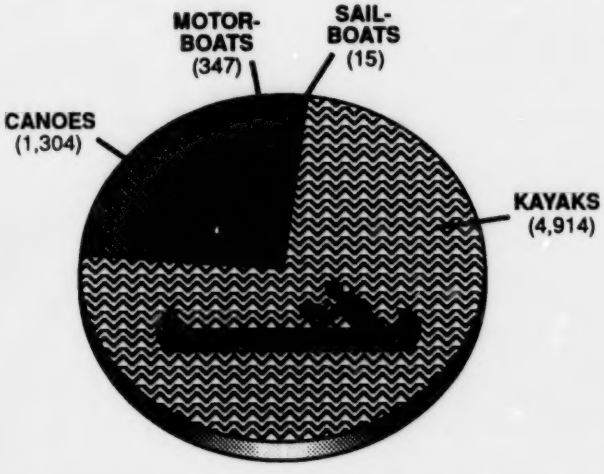
In 1990, with eight designated campsites, the Broken Group Islands accounted for approximately 11,200 camper-days, an increase of 18% over 1989 use levels.

With this amount of visitation, camping pressure in the Broken Group Islands is more than double that experienced in 1978. On the average, each site accommodates 1,400 camper-days per 4-month season (120 days), for an average occupancy rate of 11.6 campers per night every day of the season.

It is very difficult to estimate total visitation levels to the Broken Group Islands; however total visitor use by all vessel types, day use and overnight, to the Broken Group in 1990 was close to 20,000 people. The Broken Group Islands accounts for 35% of the total backcountry use in Pacific Rim, the remainder taking place along the West Coast Trail, Cape Beale and in the Nitinat Triangle.

Under current levels of use, the campsites of the Broken Group Islands are suffering from obvious signs of overuse, and illegal camping is occurring, at least partially, as a response to overcrowding and the deteriorating condition of the designated sites. The pit privy systems are also over-taxed, leading to unpleasant conditions in the vicinity of the campsites. The current approach to managing recreational activity in the Broken Group Islands is not producing the desired recreational experience and is leading to resource deterioration.

Small Craft Type Observed at Campsites



Vessel Traffic and Anchorages

There is a substantial amount of visitor use (both day and over-night) associated with larger vessels of several kinds in the Broken Group Islands. This visitor use is characterized by four vessel types: sailboats, motor boats, motor vessels (motor vessels greater then 25 feet), and fishing vessels. The monthly visitor use statistics for each of these vessels during the summer of 1990, as tabulated by the Broken Group Wardens, are found below.

Vessel Type	Month					
	June	July	August	September	TOTAL	%
Sailboats	201	670	295	117	1283	62%
Motor boats	36	112	264	111	523	25%
Motor vessels	18	93	109	30	250	12%
Fishing Vessels	6	6	9	6	27	1%
TOTAL	261	880	676	264	2081	100%

This amount of visitation is slowly increasing each year.

Some of the prime anchorage locations are in sheltered bays and inlets that are in close proximity to the designated campsites. There are anchorages at Effingham Island, Turtle Island, Nettle Island, Hand Island and Turret Island. There are no extensive sandy shores or tidal flats for beaching craft but a sheltered lagoon exists between Jaques and Jarvis Islands. There are no mooring buoys in the islands.

Day Use

Due to the isolated location of the Broken Group Islands, day use is limited primarily to those who can access the islands by power boating or sail cruising. These visitors include SCUBA divers, fishermen, whale-watching and scenic tour participants and recreational power and sail boaters. The islands are beyond the reach of paddlers for day trips.

The discussion above reported on prevailing vessel traffic in the Broken Group Islands, much of which would be day use in nature. While the average length of stay for overnight craft is about 3 days, it is not known how many of these vessels were only "passing through" on a day use basis. Warden observations indicate, however, that the number would be considerable.

With respect to recreational fishing, the area of Barkley Sound is synonomous with world-class salmon fishing. Closures and reduction of quotas on Vancouver Island's east coast, Georgia Strait, and Washington and Oregon, coupled with aggressive marketing campaigns carried out by local entrepreneurs, are attracting more anglers to park waters and to the region.

It was estimated in 1985 that the Pacific Rim region experienced about 151,000 angler-days, of which about 85%, or 129,000 angler-days (about 36,000 anglers), occurred in the Barkley Sound area. A 1989 creel survey, also from the Barkley Sound area, revealed that between the dates of July 17 and September 30 there were an estimated 42,190 boat trips in the Sound. During these trips anglers caught an estimated 77,838 salmon, 8,594 ling cod and 22,675 rockfish. While the Broken Group Islands is the most popular angling destination in the park reserve, it is not known how much of this fishing effort was actually spent in the Broken Group Islands. From wardens observations, however, it would appear that most sport fishing occurs in the open ocean outside the Broken Group Islands.

The Broken Group Islands is the most popular area in the Pacific Rim region for SCUBA diving, and of the estimated 1,500 people who dove in the Pacific Rim region in 1987, about 65-70% (970-1050) dove in the Broken Group Islands. Submerged reefs and shipwrecks provide habitat for a diversity of marine organisms and offer good opportunities for subtidal exploration. Diving opportunities vary with seasonal changes in surface conditions, visibility and distribution of marine life. Dive charters into the Islands are available from Port Alberni, at the head of Alberni Inlet, and the communities of Bamfield and Ucluelet, on opposite sides of Barkley Sound.

THE WEST COAST TRAIL UNIT

There are three components to what is now known as the West Coast Trail Unit of Pacific Rim, including the West Coast Trail itself, the Nitinat Triangle and Cape Beale.

WEST COAST TRAIL

The only area in the park available for long distance backpacking is the West Coast Trail, world renowned in hiking circles as one of Canada's finest hikes. By 1980 Canadian Parks Service had completed a five-year trail upgrading program which included the construction of 10 kilometres of boardwalk and a series of suspension bridges, cliff ladders and cable car crossings. The physiography of this shoreline is characterized by extensive sandstone outcroppings which have been shaped through the forces of coastal erosion into high cliffs with several waterfalls, broad intertidal shelves, caves, arches, sea stocks, deep ravines and other features. The frequent need for bridges, ladders and cable cars to traverse this rugged landscape has created a unique hiking experience, considered by many to be of world class.

There are two trailheads to the West Coast Trail, located at Pachena Bay at the north end of the trail and at Port Renfrew at the south end. The Pachena Bay facility consists of an information centre, parking lot, public phone and pit privies. Fresh water is trucked to the site and stored in a tank. The information centre has Visitor Services attendants present from mid-May to October 1 who now issue permits, register hikers, distribute information on the trail, deliver talks on backcountry etiquette and other management messages and collect visitor statistics. They also provide visitor information about the village of Bamfield. Canadian Parks Service also owns a small piece of property 6 hectares in size in West Bamfield which has been partially developed to provide limited parking at the trailhead to Cape Beale.

In Port Renfrew, the Canadian Parks Service operates an information facility from a small temporary building recently relocated to Canadian Parks Service property near the community of Port Renfrew. The centre is staffed during the visitor season by visitor services attendants who perform the same duties as in the Pachena Bay information centre. The Canadian Service offers no camping opportunities in Port Renfrew. The Pacheenaht Band and a private entrepeneur operate commercial campgrounds in the community. There is also seasonal accomodation for park staff in Port Renfrew. In addition, this staff provides information regarding Port Renfrew and Botanical Beach Provincial Park.

Ferry services are provided across the Nitinat narrows through contractual arrangements with the Dididaht Band. Park wardens patrol the coastal section of the West Coast Trail Unit from mid-May through until the end of September. They are responsible for enforcement of regulations, public safety and rescue operations.

Camping areas are found at the mouths of creeks, streams, and rivers along the length of the trail. These campsites are indicated on the provincial topographic map, "The West Coast Trail - Port Renfrew to Bamfield", that all hikers should be carrying. Camping is primitive. There are no amenities provided, with the exception of pit privies planned for most camping areas. Hikers must be self-sufficient.

Hiking the West Coast Trail demands stamina and expertise in hiking and camping skills. Only competent backpackers should attempt the entire route, due to the rugged topography and long distance. Trail conditions vary from moderate to very difficult. Nomally, it takes six days to hike the entire trail.

River crossings at the Gordon River and Nitinat Narrows, available from mid-May until the end of September, are provided by private operators for a fee.

NITINAT TRIANGLE

The Nitinat Triangle is one of the most pristine wilderness areas remaining on the west coast of Vancouver Island. This 100 square-kilometre area is the core of the wilderness heart of Pacific Rim and encompasses almost an entire west coast watershed which includes six fresh water lakes and undisturbed rainforest. Still undeveloped and difficult to access, the Nitinat Triangle continues to offer a challenging wildland canoeing experience.

The Nitinat represents one of the largest inland extensions of the typically coastal forest types on southern Vancouver Island. The principal climax forest communities consist of Western Hemlock, Western Red Cedar and Balsam Fir. The Nitinat seems to have escaped the massive fires that swept Vancouver Island in the mid-1600s, and many of the cedar trees average 2.5 metres (8 feet) in diameter and are 750-800 years old. The Nitinat also contains a number of bogs and other wetland communities which contain an unusually high concentration of species of grasses, sedges, mosses and liverworts.

Among other interesting features of the Nitinat are two waterfalls in addition to Tsusiat Falls on the West Coast Trail. Upstream of the scenic canyon on Hitchie Creek is the 21 metre (70 feet) high Hitchie Falls, and the Squalicum Falls drop 12 metres (40 feet) between Tsusiat and Squalicum Lakes.

Access to the Nitinat from the inland of Vancouver Island is possible only by lining a canoe up Hobiton Creek, or by using an adjacent portage trail, to Hobiton Lake. The Hobiton Creek entry is only accessible by canoe or other boat from the head or eastern shores of Nitinat Lake. It is also possible for hikers to enter the Nitinat via a short trail from the West Coast Trail to Tsusiat Lake. The wilderness core of the Nitinat is accessible only to canoeists, as there is no other form of interior circulation. Primitive portage trails have been established between the major lakes of Hobiton, Tsusiat, Little Squalicum and Squalicum, and between Tsusiat Lake and the West Coast Trail. Camping in the Nitinat is totally random and no site improvements or facilities have been provided.

CAPE BEALE

Canoe trips in the Nitinat generally vary from 1 to 10 days in length, with the most popular trip being 3 to 4 days long. Day or regular weekend trips into Hobiton Lake are possible from any population centre on southern Vancouver Island. The most popular trips into the Nitinat include weekend trips to Hobiton Lake and a long weekend or short vacation trip from Hobiton to Tsusiat Lake, a distance of 17 kilometres, and out to the Pacific Ocean. A loop trip through the chain of lakes, another popular way to enjoy the Nitinat, requires 4 to 5 days, depending on the condition of the portages.

At the northwest end of the West Coast Trail lies a small, almost unknown, semi-primitive area on Cape Beale. The Cape Beale lighthouse was built in 1874 and parts of the original six-kilometre long access trail still provide access to the light. This original trail was also the routing of an extension in 1889 of the telegraph line fromn Victoria and the Cape Beale lighthouse to the community of Bamfield. The hike to the lighthouse takes approximately three hours, and in a time of one and one-half to two hours, visitors can take other primitive trails that provide access to the isolated beaches on Tapaltos Bay and Keeha Bay, as well as to Kichha lake in the interior of the cape. The lighthouse is a popular day-use destination, both via the trail and by boat from Bamfield. Both beaches are also popular day hike destinations as well as attractive places to camp. Although short in distance, access to these sites in Cape Beale is considered difficult due to the irregular terrain and the primitive nature of the trails.

INTERPRETATION A ND INFORMATION

There is no personal interpretive programming in the West Coast Trail Unit. Extension programs have been presented to external organizations in the past, but these programs are quite limited. Information services for this section of the park are provided by park staff at either of the West Coast Trail Information Centres, by telephone and by mail. Park use permits must be picked up in person from these information centres. Pre-trip information packages are also available.

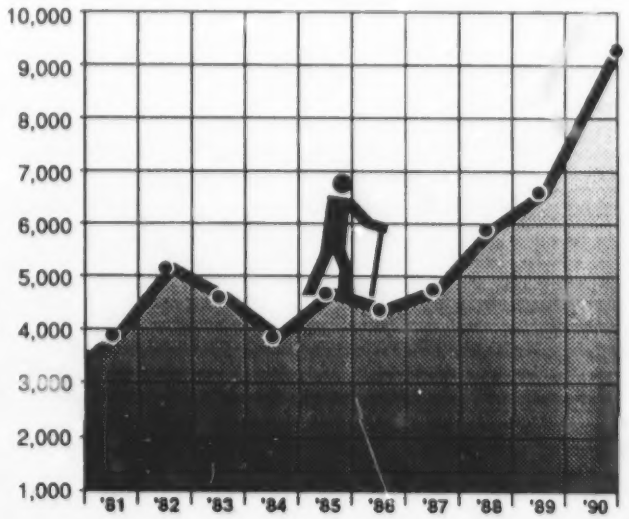
Dissatisfaction for West Coast Trail hikers tends to focus on the impact of large groups arriving at wilderness campsites, maintenance of the trail and its structures, and accumulation of litter and human waste occurring in some areas. The installation of pit privies at some campsite areas during 1990 and a restructuring of the park maintenance organization should alleviate part of this problem. A reservation system for the trail may be in effect as early as 1992.

VISITOR USE PATTERNS

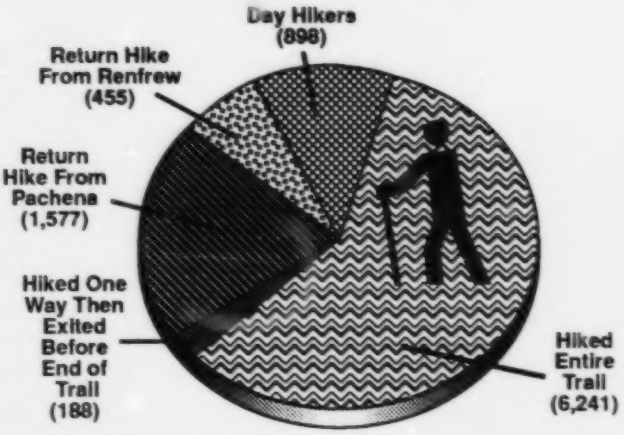
While no reliable statistics for visitor use on the West Coast Trail are available for the early years, use has increased steadily since its renewed publicity in the 1960's, the trail improvements in the 1970's and increased national and international exposure through the 1980's. Data collection for the trail began in 1981, and the statistics for that year recorded 3,970 hikers. About 57% of these hikers, or 2,270, hiked the entire length of the trail. The pattern of visitation through the early 1980's was erratic, but regular increases in trail use have been experienced every year since 1986. Trail use between 1986 and 1989 increased by 56%, with a total of 6,693 hikers on the trail in 1989. The number of hikers on the trail in the 1990 season took a dramatic leap to 9,359 people, a 40% increase over 1989.

Not everyone hikes the whole trail, of course. The percentage of hikers hiking the full length has remained remarkably consistent throughout the decade, averaging 57%. In 1990, however, 67% or 6,241 hikers completed the entire trail. The remaining number hiked only a portion of the trail. Some chose to make a short return hike on the trail, while others hiked only one way by entering or exiting at a mid-point along the trail. About 63% of hikers completing the trail begin at Port Renfrew and hike north to Pachena Bay. The opposite is the case for return trip hikers where most (78%) depart from Pachena

TOTAL HIKERS ON THE WEST COAST TRAIL: 1981-1990



**WEST COAST TRAIL
VISITOR USE PATTERNS: 1990**



Bay. The most popular destinations for these hikers are Michigan Creek, Tsusiat Falls and Nitinat Narrows. Only 455 hikers (22%) made a return trip from the Port Renfrew trailhead, where most hikers were destined for Camper Bay, the Carmanah Valley or Nitinat Narrows. A total of 188 visitors in 1990 hiked one way along the trail, either entering or exiting the trail at the Carmanah Valley or Nitinat Narrows. This represents only 6% of those hikers who did not hike the entire trail and 2% of all hikers. The most popular one way circuit on the trail is to enter through the Nitinat and hike north to Pachena Bay, closely followed by entry through the Carmanah Valley to hike north to Pachena Bay.

Day hikes represent 9.6% of total visitor use on the trail, with 84% of this day visitation emanating from the Pachena Bay trailhead.

Although the Canadian Parks Service has been unable to collect use statistics for the Nitinat, it is known that visitor use is low. Its remoteness and poor access effectively discourage all but the very hardy and adventurous from entering its core.

As with the Nitinat, there are no visitor use statistics for Cape Beale, and only cursory knowledge of visitor use levels and patterns exists. Generally speaking, use levels are low, primarily day use in nature.

FUTURE TRENDS

The statistics above revealed a growth rate of 56% between 1986 and 1989, which is an average increase of almost 19% annually for that 3-year period. Over the 8 years between 1981 and 1989, the annual growth rate was 10%. The alarming increase of 40% over 1989 levels that was experienced in the 1990 season makes future predictions difficult. If it is assumed that 1990 was an unusual year and that annual increases would continue to average 10% until 1995, approximately 16,100 hikers could conceivably be using the trail by then if no management measures were taken to intervene with the existing pattern. B.C. origins have been growing at 6.4% annually, from the rest of Canada and the United States at 9.3% annually, from Europe at 22.3% annually and from other parts of the world at 26.2% annually. If these trends from 1984 forward were to continue, the stronger growth rates for visitors from other than Canada and the United States is such that while they formed 11.6% of the hikers in 1985, they would account for 27.2% in 1995.

SUGGESTED READING LIST

The following are recommended readings for further study of Pacific Rim National Park Reserve, its surrounding area, history and flora and fauna.

PACIFIC RIM EXPLORER: The Complete Guide, by Bruce Obee, 1986. Whitecap Books, 1086 West 3rd Street, N. Vancouver, B.C. V7P 3J6

EXPLORING THE SEASHORE IN B.C., WASHINGTON AND OREGON, A Guide to Shorebirds, Intertidal Plants and Animals, by Gloria Snively, Gordon Soules Book Publishers, Burrard Street, Vancouver, B.C.

PACIFIC SEASHORES, a Guide to Intertidal Ecology, by Thomas Carefoot, 1977, J.J. Douglas Ltd., Vancouver, B.C.

PLANTS AND ANIMALS OF THE PACIFIC NORTHWEST, by Eugene N. Kozloff, 1976, J.J. Douglas Ltd., Vancouver, B.C.

SEASHORE LIFE OF THE NORTHERN PACIFIC COAST, by Eugene N. Kozloff, 1983, Douglas and McIntyre Ltd., Vancouver/Toronto, 370 pages.

WILDFOWERS OF THE PACIFIC NORTHWEST, by Lewis J. Clark, Gray's Publishing, Sidney, B.C.

BIRDS OF PACIFIC RIM NATIONAL PARK, by Dave Hatler, Wayne Campbell and Adrian Dorst, B. C. Provincial Museum, Occasional Paper Series #20, Victoria, B.C.

VANCOUVER ISLAND'S WEST COAST 1762-1962, by George Nicholson, Morriss Printing Co. Ltd., Victoria, B.C.

BARKLEY SOUND, A History of the Pacific Rim National Park Area, by R. Bruce Scott, 1972, Fleming-Review Printing Ltd., Victoria, B.C.

BREAKERS AHEAD, by R. Bruce Scott, 1970, Fleming-Review Printing Ltd., Victoria, B.C. (a history of shipwrecks in the Broken Islands Group and along the West Coast Trail)

THERE'S A LANDING TODAY, By R.E. Wells, Sono Nis Press, 1745 Blanchard Street, Victoria, B.C. V8W 2J8

SETTLING CLAYOQUOT, Sound Heritage Series #33, Provincial Archives of B.C., Victoria, B.C. V8V 1X4

SHIPWRECKS OF BRITISH COLUMBIA, by F. Rogers, 1973, J.J. Douglas Ltd., Vancouver, B.C.

A GUIDE TO SHIPWRECKS ALONG THE WEST COAST TRAIL, by R.E. Wells, Box 817, Sooke, B.C. V0S 1N0, 1981.

PEOPLE OF THE SOUTHWEST COAST OF VANCOUVER ISLAND, by R. Bruce Scott, 1974, Morriss Printing Co. Ltd., Victoria, B.C.

NOOTKA, by B.C. Dept. of Education, B.C. Series: Our Native People, Series, Vol. 5.

INDIAN PETROGLYPHS OF THE PACIFIC NORTHWEST, by B. Hill and Ray Hill, 1974, Hancock House Publishing Ltd., Saanichton, B.C.

INDIANS OF THE NORTHWEST COAST, by P. Druker, 1963, American Museum Science Book, American Museum of Natural History, Natural History Press, N.Y.

ETHNOBOTANY OF THE NITINAT INDIANS OF VANCOUVER ISLAND, by N. Turner, John Thomas, Barry Carlson and Robert Ogilvie, 1983, British Columbia Provincial Museum No. 24 Occasional Paper Series.

PACIFIC RIM NATIONAL PARK, the Geology of the Long Beach Segment, by A. H. Lang and J. E. Muller, Geological Survey of Canada (10 W. Pender, Vancouver, B.C.)

THE WEST COAST TRAIL AND NITINAT LAKES, by the Sierra Club and available from the Sierra Club, 314-620 View St., Victoria, B.C. V8W 2J6

The following Royal British Columbia Museum (formerly called the British Columbia Provincial Museum) books are recommended marine life guides:

1. Guide to Marine Life of British Columbia, by G. Clifford Carl

2. The Intertidal Univalves of British Columbia, by Lela M. Griffith.

3. The Intertidal Bivalves of B.C., by D. B. Quayle.

4. The Crabs of British Columbia, by J. Hart.

5. The Seastars of British Columbia, by P. Lambert.